REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 4, 7, and 12 have been canceled without prejudice or disclaimer, claims 1, 5, 8, 13, and 18 have been amended, and claim 21 has been added.

No new matter is being presented, and approval and entry of the foregoing amendments and new claims are respectfully requested.

Claims 1-3, 8-11, and 13-21 are pending and under consideration. Reconsideration is requested.

REJECTION UNDER 35 U.S.C. §112:

In the Office Action at page 2, the Examiner rejects claims 5, 8, 11, 13, and 15 under 35 U.S.C. §112, second paragraph, as being indefinite in reciting the term "family." Specifically, the Examiner asserts that the term "family" is unclear as requiring that the elements must have the elements in the layer or if the family members merely need to exhibit a similar physical characteristic such as a crystalline structure or the like. This rejection is respectfully traversed and reconsideration is requested.

As a general principle, 35 U.S.C. §112, second paragraph, requires that the claims be written such that one of ordinary skill in the art would understand the metes and bounds of the invention with a reasonable degree of precision. Generally, a claim term is indefinite where a meaning can have conflicting results, causing confusion to the person of ordinary skill in the art. Compare In re Moore, 1619 USPQ 236, 239 (CCPA 1971) (term fluorinated is definite since all fluorination products produce the same type of product) with In re Wiggins, 179 USPQ 421, 423 (CCPA 1973) (recited "heterocyclic group" encompasses groups having different properties than the claimed properties). Therefore, in order to establish a prima facie case of indefiniteness, the Examiner needs to provide evidence that a claim limitation, in view of the prior art as understood by one of ordinary skill in the art, would be sufficiently unclear as to not allow the person of ordinary skill in the art to understand the metes and bounds of the claim. See, MPEP 2173.02.

By way of an example, claim 5 recites a "GeSbTe family." The Examiner has not provided evidence based upon conflicting understandings in the prior art that the term "family" would not be understood by one of ordinary skill in the art. Further, in the context of chemical compositions, it is noted that the term "family" appears to be well defined. See, McGraw-Hill,

Dictionary of Scientific and Technical Terms, p. 732 (McGraw-Hill, Inc.) (5th Ed. 1994)("family" defined as "a group of elements whose chemical properties, such as valence, solubility of salts, and behavior toward reagents are similar.") The Examiner has not proffered a source for an alternative definition that would cause confusion to one of ordinary skill in the art. Further, a review of patents issued since 1977 reveals that the term "family" is contained as a claim limitation in over 3000 patents. As such, since the Examiner has not provided evidence of confusion in the art, and since the term "family" appears to have a sufficiently accepted meaning for those of ordinary skill in the art, it is respectfully submitted that the use of the term "family" in claims 5, 8, 11, 13 and 15 is sufficiently understood so as to be compliant with the requirements of 35 U.S.C. §112.

A. REJECTION UNDER 35 U.S.C. §102:

1. Rejection of claims 1, 2, 7-9, 12, 14, and 17-20 in view of Coombs et al.

In the Office Action at pages 2-3, the Examiner rejects claims 1, 2, 7-9, 12, 14, and 17-20 under 35 U.S.C. §102(b) in view of Coombs et al. (U.S. Patent No. 5,604,003). This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 7 and 12 have been cancelled without prejudice or disclaimer. As such it is respectfully submitted that the rejections of claims 7 and 12 are deemed moot.

The Examiner asserts that example 2 of Coombs et al. discloses a GeTeSe phase change recording layer, a dielectric layer, and a gold layer acting as a phase control layer. By way of review, Coombs et al. discloses an optical information carrier having layers of material in an MIPIM structure, which in Example 2 includes a reflective layer 5 of Au, a dielectric layer 7 of Ta_2O_5, a recording layer 9 of $Ge_{50}Te_{25}Se_{25}$, a dielectric layer 11 of Ta_2O_5, and a reflective layer 13 of Au. (Col. 3, lines 8-26, col. 5, lines 7-20, col. 8, lines 9-28; FIG. 4). One of the reflection layers 5 and 13 is disclosed as being fully reflective, while the other is disclosed as being semi-transparent. (Col. 3, lines 23-26). Thus, when irradiated by a laser-light beam a, some of the light beam passes through the semi-transparent reflective layer 5 in order to form a light spot on the recording layer 9 as shown in FIG. 4. There is no disclosure that either of the reflective layers 5 and 13, when irradiated by the laser-light beam a, undergoes a phase change or has areas within a light spot that undergo a phase change.

In contrast, claim 1 recites a phase control layer having areas defined in a laser spot.

When irradiated by a reproducing beam, one of the areas changes phase so as to alter an optical path of the reproducing beam reflected from the phase change recording layer. As such, it is respectfully submitted that Coombs et al. does not disclose "a phase control layer... having *two areas defined in a laser spot*," "wherein the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas *changing between a crystal and an amorphous phase* that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 1.

Similarly, it is respectfully submitted that Coombs et al. does not disclose "a phase control layer ... having a plurality of areas defined in a laser spot," "wherein the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 18.

Further, it is respectfully submitted that Coombs et al. does not disclose that "one of the two areas defined on said phase control layer has a phase difference ... that substantially has a minimum value of 0 degrees, and the other area has a phase difference ... that substantially has a maximum value of 180 degrees" as recited in claim 9, and similarly in claims 14 and 20.

Lastly, it is also respectfully submitted that Coombs et al. does not disclose that either of the reflective layers 5 and 13 has a temperature profile that defines areas within a light spot. As such, it is respectfully submitted that Coombs et al. does not disclose "a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam" as recited in claim 19.

Claims 2, 8, and 17 are deemed patentable due at least to their depending from claim 1.

2. Rejection of claims 1, 2, and 7-20 in view of Tominaga et al.

In the Office Action at page 3, the Examiner rejects claims 1, 2, and 7-20 under 35 U.S.C. §102(b) in view of Tominaga et al. (U.S. Patent No. 5,569,517). This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 7 and 12 have been cancelled without prejudice or disclaimer. As such it is respectfully submitted that the rejections of claims 7 and 12 are deemed moot.

The Examiner asserts that an AgSbTeInV phase-changing masking layer discloses the

phase control layer as recited in claim 1. By way of review, Tominaga et al. discloses a mask layer 32 that is irradiated by a reading light. Within the reading light, the intensity decreases from a center to an edge. As such, the mask layer 32 is more intensely heated at a center of a light spot so as to undergo a crystal-to-crystal transition in area H, whereas the edge of the light spot does not undergo a transition in area L. In this way, light incident on only one of area H and area L is able to be reflected as to allow reading of information. (Col. 4, lines 65-67, col. 5, lines 1-27. However, while Tominaga et al. discloses that the area H undergoes a crystal-to-crystal transition, Tominaga et al. does not disclose that the area H undergoes a crystal-to-amorphous transition.

In contrast, claim 1 recites a phase control layer having areas defined in a laser spot. When irradiated by a reproducing beam, one of the areas changes between a crystal and an amorphous phase so as to alter an optical path of the reproducing beam reflected from the phase change recording layer. As such, it is respectfully submitted that Tominaga et al. does not disclose "a phase control layer... having two areas defined in a laser spot, " "wherein the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas *changing between a crystal and an amorphous phase* that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 1.

Similarly, it is respectfully submitted that Tominaga et al. does not disclose "a phase control layer ... having a plurality of areas defined in a laser spot," "wherein the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to *ones of the plurality of areas being converted between a crystalline and an amorphous state* that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 18.

Claims 2, 8-11, 13-17, 19 and 20 are deemed patentable due at least to their depending from corresponding claims 1 and 18.

3. Rejection of claims 1, 12, and 14-20 in view of Ohno et al.

In the Office Action at page 4, the Examiner rejects claims 1, 12, and 14-20 under 35 U.S.C. §102(b) in view of Ohno et al. (U.S. Patent No. 5,348,783). This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claim 12 has been cancelled without prejudice or disclaimer.

As such it is respectfully submitted that the rejection of claim 12 is deemed moot.

The Examiner asserts that the alternating layers of GeTeSb recording layers of Example 1 disclose the phase control layer as recited in claim 1. By way of review, Ohno et al. discloses an optical information recording medium having a recording layer 2 that comprises alternating optically-active layers 5 and amorphous acceleration layers 6 as shown in FIG. 2. The optically-active layers 5 are of phase-changing materials and are thin so as to allow rapid heating and cooling. (Col. 6, lines 26-35). The amorphous acceleration layers 6 are of dielectric materials chosen to rapidly dissipate heat from the optically-active layers 5. (Col. 5, lines 60-68). The purpose of this construction is to increase the rate at which information is recorded and erased on and from the recording layer 2. Specifically, the combination of the thin optically-active layers 5 and the amorphous acceleration layers 6 produces a large cooling rate that cannot otherwise be achieved. (Col. 6, lines 40-45). While Ohno et al. discloses that the optically-active layers 5 change states when irradiated for the purposes of high-speed recording and erasing of data, there is no disclosure that the optically-active layers 5 change state in only certain areas within a light spot.

In contrast, claim 1 recites a phase control layer having areas defined in a laser spot. When irradiated by a reproducing beam, one of the areas changes phase so as to alter an optical path of the reproducing beam reflected from the phase change recording layer. As such, it is respectfully submitted that Ohno et al. does not disclose "a phase control layer... having two areas defined in a laser spot, " "wherein the irradiation with the reproducing beam of said phase control layer within the *laser spot causes a phase difference due to one of the two areas changing between a crystal and an amorphous phase* that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 1.

Similarly, it is respectfully submitted that Ohno et al. does not disclose "a phase control layer ... having a plurality of areas defined in a laser spot," "wherein the irradiation of the laser spot on said phase control layer with the reproducing *beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state* that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 18.

Further, it is respectfully submitted that Ohno et al. does not disclose that "one of the two areas defined on said phase control layer has a phase difference ... that substantially has a minimum value of 0 degrees, and the other area has a phase difference ... that has a maximum

value of 180 degrees" as recited in claim 14 and similarly in claim 20.

Lastly, it is also respectfully submitted that Ohno et al. does not disclose that the optically-active layers 5 have a temperature profile that defines areas within a light spot. As such, it is respectfully submitted that Ohno et al. does not disclose "a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam" as recited in claim 19.

Claims 15-17 are deemed patentable due at least to their depending from claim 1.

4. Rejection of claims 1, 2, and 7-20 in view of Kasami et al.

In the Office Action at page 4, the Examiner rejects claims 1, 2, and 7-20 under 35 U.S.C. §102(b) in view of Kasami et al. (U.S. Patent No. 5,768,221). This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 7 and 12 have been cancelled without prejudice or disclaimer. As such it is respectfully submitted that the rejections of claims 7 and 12 are deemed moot.

The Examiner asserts that the use of dual recording layers 21 and 22 in FIG. 3 of Kasami et al. discloses a phase control layer and a phase change recording layer as recited in claim 1. By way of review, Kasami et al. discloses an optical disk having multiple recording layers 21 and 22. In order to access each layer, different objective lenses 5a and 5b form light spots 6A, 6B on the corresponding recording layers 21 and 22. (Col. 5, lines 1-4; FIG. 3). The light spots 6A, 6B change the states of the phase change materials 27, 30 of the corresponding recording layers 21 and 22 so as to record data. (Col. 5, lines 20-24; FIG. 1). However, there is no disclosure that when either of the recording layers 21 or 22 is irradiated with the light spot 6A or 6B, portions of the phase change material 27 or 30 within the light spot 6A or 6B undergo a state change while other portions do not.

In contrast, claim 1 recites a phase control layer having areas defined in a laser spot. When irradiated by a reproducing beam, one of the areas changes phase so as to alter an optical path of the reproducing beam reflected from the phase change recording layer. As such, it is respectfully submitted that Kasami et al. does not disclose "a phase control layer... having two areas defined in a laser spot, " "wherein the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas changing between a crystal and an amorphous phase that alters an optical path of the

reproducing beam reflected from said phase change recording layer" as recited in claim 1.

Similarly, it is respectfully submitted that Kasami et al. does not disclose "a phase control layer ... having a plurality of areas defined in a laser spot," "wherein the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 18.

Further, it is respectfully submitted that Kasami et al. does not disclose that "one of the two areas defined on said phase control layer has a phase difference ... that substantially has a minimum value of 0 degrees, and the other area has a phase difference ... that substantially has a maximum value of 180 degrees" as recited in claim 9, and similarly in claims 14 and 20.

Lastly, it is also respectfully submitted that Kasami et al. does not disclose that one of the recording layers 21 and 22 has a temperature profile that defines areas within a light spot. As such, it is respectfully submitted that Kasami et al. does not disclose "a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam" as recited in claim 19.

Claims 2, 8, 10, 11, 13 and 15-17 are deemed patentable due at least to their depending from claim 1.

5. Rejection of claims 1, 2, and 7-20 in view of Rosen et al.

In the Office Action at page 4, the Examiner rejects claims 1, 2, and 7-20 under 35 U.S.C. §102(b) in view of Rosen et al. (U.S. Patent No. 5,761,188). This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 7 and 12 have been cancelled without prejudice or disclaimer. As such it is respectfully submitted that the rejections of claims 7 and 12 are deemed moot.

The Examiner asserts that the use of dual recording layers 90 and 92 in FIG. 3 of Rosen et al. discloses a phase control layer and a phase change recording layer as recited in claim 1. By way of review, Rosen et al. discloses an optical disk having multiple recording layers 90 and 92. In order to access each layer, actuator motors 216 adjust an objective lens 210 so as to form light spots on one of the recording layers 90 and 92. (Col. 5, lines 25-30; FIG. 3). There is no disclosure that when either of the recording layers 90 and 92 is irradiated with the light spot,

only portions of the recording layer 90 or 92 within the light spot undergo a state change.

In contrast, claim 1 recites a phase control layer having areas defined in a laser spot. When irradiated by a reproducing beam, one of the areas changes phase so as to alter an optical path of the reproducing beam reflected from the phase change recording layer. As such, it is respectfully submitted that Rosen et al. does not disclose "a phase control layer... having two areas defined in a laser spot, " "wherein the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas changing between a crystal and an amorphous phase that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 1.

Similarly, it is respectfully submitted that Rosen et al. does not disclose "a phase control layer ... having a plurality of areas defined in a laser spot," "wherein the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 18.

Further, it is respectfully submitted that Rosen et al. does not disclose that "one of the two areas defined on said phase control layer has a phase difference ... that substantially has a minimum value of 0 degrees, and the other area has a phase difference ... that substantially has a maximum value of 180 degrees" as recited in claim 9, and similarly in claims 14 and 20.

Lastly, it is also respectfully submitted that Rosen et al. does not disclose that one of the multiple recording layers 90 and 92 has a temperature profile that defines areas within the light spot. As such, it is respectfully submitted that Rosen et al. does not disclose "a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam" as recited in claim 19.

Claims 2, 8, 10, 11, 13 and 15-17 are deemed patentable due at least to their depending from claim 1.

6. Rejection of claims 1, 2, and 7-20 in view of Miyauchi et al.

In the Office Action at page 5, the Examiner rejects claims 1, 2, and 7-20 under 35 U.S.C. §102(b) in view of Miyauchi et al. (Japanese Patent Publication No. 09-007224). This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 7 and 12 have been cancelled without prejudice or

disclaimer. As such it is respectfully submitted that the rejections of claims 7 and 12 are deemed moot.

The Examiner asserts that the use of recording films 4, 6, 8 in FIG. 1 of Miyauchi et al. discloses a phase control layer and a phase change recording layer as recited in claim 1. By way of review, Miyauchi et al. discloses an optical disk having multiple recording films 4, 6, 8. During recording, each of the recording films 4, 6, 8 is melted. (Abstract of Miyauchi et al.) There is no disclosure that, when one of the recording films 4, 6, 8 is irradiated in a light spot, portions of the recording films 4, 6, 8 undergo a state change.

In contrast, claim 1 recites a phase control layer having areas defined in a laser spot. When irradiated by a reproducing beam, one of the areas changes phase so as to alter an optical path of the reproducing beam reflected from the phase change recording layer. As such, it is respectfully submitted that Miyauchi et al. does not disclose "a phase control layer... having two areas defined in a laser spot, " "wherein the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas changing between a crystal and an amorphous phase that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 1.

Similarly, it is respectfully submitted that Miyauchi et al. does not disclose "a phase control layer ... having a plurality of areas defined in a laser spot," "wherein the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 18.

Further, it is respectfully submitted that Miyauchi et al. does not disclose that "one of the two areas defined on said phase control layer has a phase difference ... that substantially has a minimum value of 0 degrees, and the other area has a phase difference ... that substantially has a maximum value of 180 degrees" as recited in claim 9, and similarly in claims 14 and 20.

Lastly, it is also respectfully submitted that Miyauchi et al. does not disclose that one of the recording films 4, 6, 8 has a temperature profile that defines areas within a light spot. As such, it is respectfully submitted that Miyauchi et al. does not disclose "a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam" as recited in claim 19.

Claims 2, 8, 10, 11, 13 and 15-17 are deemed patentable due at least to their depending

from claim 1.

7. Rejection of claims 1, 2, and 7-20 in view of Akahira et al.

In the Office Action at page 5, the Examiner rejects claims 1, 2, and 7-20 under 35 U.S.C. §102(b) in view of Akahira et al. (Japanese Patent Publication No. 03-157830). This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 7 and 12 have been cancelled without prejudice or disclaimer. As such it is respectfully submitted that the rejections of claims 7 and 12 are deemed moot.

The Examiner asserts that the use of recording thin film layers 3 and 5 of Akahira et al. discloses a phase control layer and a phase change recording layer as recited in claim 1. By way of review, Akahira et al. discloses an optical disk having recording thin film layers 3 and 5. (Abstract of Akahira et al.) There is no disclosure that, when one of the recording thin film layers 3 and 5 is irradiated in a light spot, portions of the recording thin film layers 3 and 5 undergo a state change.

In contrast, claim 1 recites a phase control layer having areas defined in a laser spot. When irradiated by a reproducing beam, one of the areas changes phase so as to alter an optical path of the reproducing beam reflected from the phase change recording layer. As such, it is respectfully submitted that Akahira et al. does not disclose "a phase control layer... having two areas defined in a laser spot, " "wherein the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas changing between a crystal and an amorphous phase that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 1.

Similarly, it is respectfully submitted that Akahira et al. does not disclose "a phase control layer ... having a plurality of areas defined in a laser spot," "wherein the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state that alters an optical path of the reproducing beam reflected from said phase change recording layer" as recited in claim 18.

Further, it is respectfully submitted that Akahira et al. does not disclose that "one of the two areas defined on said phase control layer has a phase difference ... that substantially has a minimum value of 0 degrees, and the other area has a phase difference ... that substantially has

a maximum value of 180 degrees" as recited in claim 9, and similarly in claims 14 and 20.

Lastly, it is also respectfully submitted that Akahira et al. does not disclose that one of the recording thin film layers 3 and 5 has a temperature profile that defines areas within a light spot. As such, it is respectfully submitted that Akahira et al. does not disclose "a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam" as recited in claim 19.

Claims 2, 8, 10, 11, 13 and 15-17 are deemed patentable due at least to their depending from claim 1.

B. REJECTION UNDER 35 U.S.C. §103:

1. Rejection of claims 1, 2, 7-10, 12, 14, and 16-20 in view of Coombs et al. and the Examiner's taking Official Notice

In the Office Action at page 3, the Examiner rejects claims 1, 2, 7-10, 12, 14, and 16-20 under 35 U.S.C. §103 in view of Coombs et al. and the Examiner's taking Official Notice that the recited dielectric materials can be used. This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 7 and 12 have been cancelled without prejudice or disclaimer. As such it is respectfully submitted that the rejections of claims 7 and 12 are deemed moot.

Even assuming arguendo that the Examiner is correct in taking Official Notice with regard to the recited dielectric materials, it is respectfully submitted that the Examiner's taking Official Notice does not cure the above noted deficiencies of Coombs et al. as applied to claims 1, 2, 8, 9, 14, and 17-20 as discussed in Section A(1) above. As such, it is respectfully submitted that the combination of Coombs et al. and the Examiner's taking Official Notice does not disclose or suggest the invention recited in claims 1, 2, 8-10, 14, and 16-20.

2. Rejection of claims 1-20 in view of Tsukagoshi et al. and the prior art discussed in Section A

In the Office Action at page 5, the Examiner rejects claims 1-20 under 35 U.S.C. §103 in view of Tsukagoshi et al. (U.S. Patent No. 5,981,014) and each of the references discussed in Section A above. This rejection is respectfully traversed and reconsideration is requested.

As a point of clarification, claims 4, 7 and 12 have been cancelled without prejudice or disclaimer. As such it is respectfully submitted that the rejections of claims 4, 7 and 12 are deemed moot.

The Examiner asserts that Tsukagoshi et al. discloses a dielectric layer disposed between a reflective layer and a UV cured layer. Even assuming arguendo that the Examiner is correct, it is respectfully submitted that Tsukagoshi et al. does not cure the above noted deficiencies of the references as applied to the claims as discussed above in Section A. As such, it is respectfully submitted that the combinations of Tsukagoshi et al. and the prior art discussed in Section A above does not disclose or suggest the invention recited in claims 1-20.

ATTACHMENT:

Attached hereto is a "Version With Markings to Show Changes Made," comprising a marked-up version of changes made to the Claims by the current amendment.

PATENTABILITY OF NEW CLAIMS:

Claim 21 is deemed patentable due at least to the prior art not disclosing a phase control layer having areas within a first light spot that change between a crystalline and an amorphous phase to form a second light spot on a recording layer.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot. And further, it is respectfully submitted that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any additional fees associated with the filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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VERSION WITH MARKING TO SHOW CHANGES MADE

IN THE CLAIMS:

Please **CANCEL** claims 4, 7, and 12 without prejudice or disclaimer, **AMEND** claims 1, 5, 8, 13, and 18, and **ADD** claim 21, as follows. The remaining claims are reprinted, as a convenience to the Examiner, as they presently stand before the U.S. Patent and Trademark Office.

1. (ONCE AMENDED) A phase change optical disc compatible with a recording beam and a reproducing beam, comprising:

a transparent substrate;

at least one first dielectric layer thinly formed on said transparent substrate;

a phase change recording layer which converts between the crystal phase and the amorphous phase by irradiation with the recording beam;

a reflective layer; and

a phase control layer disposed between said transparent substrate and said phase change recording layer, said phase control layer having two areas defined in a laser spot, the laser spot defined by where the reproducing beam is incident to said phase control layer[;]_,

wherein the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas changing between a crystal and an amorphous phase that alters an optical path of the reproducing beam reflected from said phase change recording layer.

2. (NOT AMENDED)The phase change optical disc of claim 1, further comprising:

a second dielectric layer;

a third dielectric layer; and

a protective layer;

wherein said first dielectric layer, said phase control layer, said second dielectric layer, said phase change recording layer, said third dielectric layer, said reflective layer, and said protective layer are sequentially laminated on said transparent substrate.

3. (NOT AMENDED)The phase change optical disc of claim 2, further comprising a fourth dielectric layer disposed between said reflective layer and said protective layer.

4. (CANCELED)

5. (ONCE AMENDED)The phase change optical disc of claim [4] 3, wherein said phase control layer is formed of a material selected from the group consisting essentially of the GeSbTe family, InSbTe family, AgInSb family, Au, and Ni.

6. (NOT AMENDED)The phase change optical disc of claim 3, wherein one of the two areas defined on said phase control layer has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a minimum value of 0 degrees, and the other area has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a maximum value of 180 degrees.

7. (CANCELED)

8. (ONCE AMENDED)The phase change optical disc of claim [7] 5, wherein said phase control layer is formed of a material selected from the group consisting essentially of the GeSbTe family, InSbTe family, AgInSb family, Au, and Ni.

9. (NOT AMENDED)The phase change optical disc of claim 2, wherein one of the two areas defined on said phase control layer has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a minimum value of 0 degrees, and the other area has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a maximum value of 180 degrees.

10. (NOT AMENDED)The phase change optical disc of claim 2, wherein each of said first, second, and third dielectric layers is formed of a material selected from the group consisting essentially of Al_2O_3, ZnS-SiO_2, Si_3N_4, SiO_2, MgF_2, NaF_2, LiF_2, CaF_2, and AlF_2.

11. (NOT AMENDED)The phase change optical disc of claim 2, wherein said phase change recording layer is formed of a material selected from the group consisting essentially of the GeSbTe family, InSbTe family, and the AgInSbTe family.

12. (CANCELED)

13. (ONCE AMENDED)The phase change optical disc of claim [11] 1, wherein the phase control layer is formed of a material selected from the group consisting essentially of the GeSbTe family, InSbTe family, AgInSb family, Au, and Ni.

14. (NOT AMENDED)The phase change optical disc of claim 1, wherein one of the two areas defined on said phase control layer has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a minimum value of 0 degrees, and the other area has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that has a maximum value of 180 degrees.

15. (NOT AMENDED)The phase change optical disc of claim 1, wherein said phase change recording layer is formed of a material selected from the group consisting essentially of the GeSbTe family, InSbTe family, and the AgInSbTe family.

16. (NOT AMENDED)The phase change optical disc of claim 1, wherein each of said first, second, and third dielectric layers is formed of a material selected from the group consisting essentially of Al_2O_3, ZnS-SiO_2, Si_3N_4, SiO_2, MgF_2, NaF_2, LiF_2, CaF_2, and AlF_2.

17. (NOT AMENDED)The phase change optical disc of claim 1, wherein said reflective layer is formed of a material selected from the group consisting essentially of Al, Al-Ti, Cu, Au, and alloys of any of the above.

18. (ONCE AMENDED) A phase change optical disc compatible with a recording beam and having multiple layers formed on a transparent substrate, the multiple layers including a reflective layer, comprising:

a phase change recording layer which converts between the crystal phase and the amorphous phase by irradiation with the recording beam; and

a phase control layer disposed between the transparent substrate and said phase change recording layer, said phase control layer having a plurality of areas defined in a laser spot, the laser spot defined by where the reproducing beam is incident to said phase control layer[;],

wherein the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state that alters an optical path of the reproducing beam reflected from said phase change recording layer.

19. (NOT AMENDED)The phase change optical disc of claim 18, wherein a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam.

20. (NOT AMENDED) The phase change optical disc of claim 18, wherein the plurality of areas comprise at least one area that has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a value of 0 degrees, and at least one other area which has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially which substantially has a value of 180 degrees.

21. (NEW) An optical disc compatible with a reproducing beam and having multiple layers formed on a transparent substrate, comprising:

a recording layer having recording marks to be reproduced using the reproducing beam forming a first laser spot on said recording layer; and

a phase control layer disposed between the transparent substrate and said recording layer upon which the reproducing beam forms a second laser spot,

wherein the irradiation of the second laser spot on said phase control layer causes one area of said phase control layer within the second laser spot to be converted between a crystalline and an amorphous state so as to alter an optical path of a portion of the reproducing beam such that the second laser spot is larger than the first laser spot.